WHAT IS CLAIMED IS:

1. A fuel cell comprising a stack of:

at least one individual cell with a cathode-electrolyte-anode unit; and

at least one bipolar plate; wherein,

the individual cell comprises a porous support structure for the cathode-electrolyte-anode unit applied thereupon; and

the porous support structure comprises a material selected from the group consisting of a metal knit, weave and plait.

2. The fuel cell according to Claim 1, wherein the porous support structure is arranged between the cathode-electrolyte-anode unit and the bipolar plate.

3. A fuel cell comprising a stack of:

at least one individual cell with an cathode-electrolyte-anode unit, at least one bipolar plate, and a porous support structure upon which the cathode-electrolyte-anode unit is applied; wherein,

the porous support structure through which a fluid flows possesses a changing flow resistance in the flow direction and/or perpendicular thereto; and

the porous support structure comprises a material selected from the group consisting of a metal knit, weave or plait.

4. The fuel cell according to Claim 3, wherein the changing flow resistance is attained by one of a change in wire thickness of the wire that forms the support structure, a change of mesh density, a change of material density, and changing the shape of the mesh or the surface condition of the loops in the support structure variously selected during manufacture of the support structure.

5. The fuel cell according to Claim 3, wherein the changing flow resistance is achieved by a broadening of the flow cross section.

6. The fuel cell according to Claim 5, wherein the changing flow resistance is achieved by diverging channels in the support structure.

7. The fuel cell according to Claim 1, wherein the support structure wires comprise at least one material selected from the group consisting of nickel, ferritic or austenitic alloys, and high-grade steel.

8. The fuel cell according to Claim 1, wherein the support structure wire is at least partially coated with a corrosion-resistant material.

9. The fuel cell according to Claim 1, wherein the support structure comprises wires of differing material dimensions or surface.

10. The fuel cell according to Claim 1, wherein edge bands or edge strips are provided on the support structure and/or porous reinforcement coatings, or porous foil are applied to the surface of the support structure.

11. The fuel cell according to Claim 1, wherein the wires of the support structure are connected firmly to one another on their contact and bearing points, by one of gluing, soldering, sintering or welding.

12. The fuel cell according to Claim 1, wherein an anode is applied provided on the support structure, followed the electrolyte applied to the anode, and the cathode applied to the electrolyte.

13. The fuel cell according to Claim 12, wherein a mixture is used, said mixture including ZrO_2 and an additional constituent selected from the group consisting of nickel, a nickel alloy, and a nickel-aluminum alloy.

14. A method for manufacturing a fuel cell which includes a stack of at least one individual cell with an cathode-electrolyte-anode unit and at least one bipolar plate, wherein the at least one individual cell comprises a porous support structure built up of metal wire in the form of a knit or weave or plait or fabric on which the anode-electrolyte-cathode unit is applied, said method including:

forming the support structure from metal wires; and

subsequently applying the cathode-electrolyte-anode unit to the support structure.

15. The method according to Claim 14, wherein in the subsequent successive application of the cathode-electrolyte-anode unit, a first

electrode layer is applied to the support structure, after which the electrolyte is applied to the first electrolyte layer, and subsequently a second electrode layer is applied to the electrolytes.

16. The method according to Claim 14, wherein during or after construction of the support structure and prior to the application of an electrode layer in or on the support structure, a spraying barrier or stream brake is introduced onto the surface of the support structure or into the support structure into the vicinity of its surface.

17. The method according to Claim 16, wherein wires made of a material that can be subsequently dissolved, is woven or knitted into the support surface as a spraying barrier or stream brake.

18. The method according to Claim 17, wherein:

the wires are comprised of aluminum; and

following application of the electrode layer or layers to the support structure, the aluminum wires are washed out.

19. The method according to Claim 17, wherein:

the wires are comprised of carbon; and

the wires are dissolved or reacted out using oxygen or hydrogen following the application of the electrode coating or coatings to the support structure.

20. The method according to Claim 16, wherein a filler compound is introduced on the electrode side into the support structure as a spraying barrier or stream brake.

21. The method according to Claim 20, wherein the filler mass is removed temporally during or following the application of the electrode coating or coatings to the support structure.

22. The method according to Claim 20, wherein:

a filler compound is used; and

the filler compound comprise a material selected from the group consisting of a ceramic, a metal and a graphite slop.

23. The method according to Claim 20, wherein the filler compound is removed during or following the application of the electrode layer or layers to the support structure.

24. The method according to Claim 16, wherein a graphite foil is provided as a spraying barrier or stream brake on the electrode side or into the support structure.

25. The method according to Claim 16, wherein:

the support structure is laid on a dense foundation; and

the spraying barrier or stream brake is produced using a thermal injection method; and

a depositing or cover layer is generated near the dense foundation by irradiation of the support structure.

26. The method according to Claim 25, wherein the deposition or cover layer forms at least a part of the electrode layer.

27. The method according to Claim 14, wherein intermediate spaces of the layer of the support structure near the anode are filled with a filler compound mixed with pore formers.

28. The method according to Claim 14, wherein the layer of the support structure near the anode is sintered prior to application of the electrode layer with a porous cover layer comprising a metallic, ceramic or metal-ceramic material.

29. The method according to Claim 14, wherein a porous foil made of an electrically conductive material, is applied to the electrode side of the support structure before the electrode coat is applied.

30. The method according to Claim 29, wherein porosity of the foil is generated after it is applied, mechanically or electrochemically or thermally.

31. The method according to Claim 14, wherein:

the electrode layer or layers, are applied with a thermal coating method to the support structure; and

a spraying barrier or stream brake or cover layer prevents an excessive penetration of the electrode material into the support structure.

32. The method according to Claim 31, wherein a flame spraying method or a plasma spraying method, especially an atmospheric plasma spraying, a vacuum plasma spraying, or a low pressure plasma spraying method is used as the thermal coating method.

33. The method according to Claim 14, wherein an electrode support layer or cover layer is applied as a first layer to the support structure on which the active electrode is applied, and nickel, a nickel alloy or a nickel-aluminum alloy is used for the electrode base layer.

34. The method according to Claim 14, wherein one of a metal wire skeleton, a wire fabric, a wire lattice or longitudinal wires are worked into the support structure as strength increasing elements, prior to a thermal coating process on the support structure.

35. The method according to Claim 34, wherein edge bands or edge strips made of metal foil, are worked into the support structure, or the edge of the support structure is extruded suitably to form an edge strip.

36. The method according to Claim 14, wherein wires of the support structure that lie one on another are connected to one another by one of gluing, soldering, sintering and welding electric resistance welding or cold welding.

37. The method according to Claim 36, wherein after the support structure has been produced, metallic electrodes are laid on the upper side and under side of the support structure, and are subjected to a current impulse to join the wires that form the support structure.

38. The method according to Claim 36, wherein the support structure is continuously passed through linear electrodes, plates, or rollers for continuous welding.

39. The method according to Claim 14, wherein the support structure is connected with the bipolar plate by a method selected from the group consisting of cold welding, welding, soldering and sintering.

40. The method according to Claim 14, wherein at least one of mesh width, loop density, the loop arching, a shape of the mesh of the support structure, and thickness of the wire used to form the support

structure, is changed during its construction such that a flow resistance which is different over the length and thickness arises in the support structure.

41. The method according to Claim 14, wherein diverging channels are constructed with a changing flow cross-section in the support structure.

42. The method according to Claim 41, wherein the diverging channels are constructed during the building of the support structure by choice of one of wire thickness, mesh density and loop shape.

43. The method according to Claim 41, wherein the diverging channels are formed after the construction of the support structure by imprinting or impressing.

44. The method according to Claim 41, wherein the support structure is stressed in individual operations especially over a convex foundation surface.

45. The method according to Claim 14, wherein:

the support structure is continuously manufactured in the form of a band; and

subsequent production steps are performed in a continuous operation.